

XI. *The Hybernation of Vanessa atalanta in Captivity.*

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IN the autumn of 1909 I saved seven specimens of *Vanessa atalanta* to see if it were possible to hibernate them in England under unnatural conditions.

I have many times tried them out of doors, also in a cold greenhouse, but in both cases failed, the specimens dying off early in the winter.

I prepared a small cardboard box about 9 by 6 by 6 inches deep, cut out the lid, leaving only the frame of cardboard, stretched mosquito netting over box and held this down with the cardboard frame.

The butterflies were placed in this and the box stood by a window facing east, and at night removed to a warmer quarter of the room; there was always a fire in my room and also a large boiler which was warm all night, so that the specimens never had a lower temperature than, say, 35 degrees even on the coldest nights.

After two or three days they became very restless and evidently required food. I well soaked a good-size piece of absorbent cotton-wool in water and sprinkled cane sugar on it; this I placed in the centre of the box on the top of the mosquito netting; very soon their tongues had found the sweets and they were busy feeding; they walked about in the box, continuously opening their wings when the sun was shining, and about midday retired to the darkest corner of the box.

Throughout the whole winter they fed regularly every few days, and on no day when there was any sun did they remain quiet, no matter how cold it was out of doors.

The first casualty happened in December, when a specimen became quite paralyzed; he seemed to have indulged too freely in food, for his body became very much distended, and he lay for many hours at the bottom of the box with legs twitching and wings quivering before he died.

In January the specimens became very tame, and it was my habit to let them fly about in my room on sunny

mornings; they would settle on the curtains with wings expanded and sun themselves; they would also feed from my hand, and enjoyed a piece of apple with sugar sprinkled on it, or a banana; they seemed to like the extra space, and the exercise, I thought, would keep them strong, as they took so much food.

In February I lost a second specimen, which flew into the fire; this left me with only five. All went well, and no more met with unhappy endings.

Early in March I placed them during the day out of doors in a roomy cage under a glass-roofed house with open sides and gave them a pot of growing nettles; no sign of pairings took place, but in early May a fair quantity of ova were deposited; these, however, proved to be infertile, and, on examining the specimens, I found all were ♀♀, the only ♂♂ having been the victims of the winter; this greatly disappointed me.

The last specimen lived till the end of May.

I think these observations clear up a point which has long been in doubt, and prove that *V. atalanta* is not a true hybernator, and requires food all the winter, and that very seldom, if ever, they pass the winter as imagines in England; we are therefore entirely dependent on immigration every year for this beautiful, though common, butterfly. 1910 has been a very bad "*Atalanta*" year. I have seen, personally, only two specimens on the wing, and found one larva, and have heard of very few larvae or imagines being seen in England this year.

I had six pupae sent to me from Devonshire; these I bred out, and have the imagines alive. Mr. T. Reuss has sent me eight living specimens, two of which met with an accident a few days after arrival, so this winter I have twelve specimens, and with these few I hope to be able to clear up a further point next year, and that is to find out whether the species pairs in the spring. I have noticed no sign of autumnal pairings.